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## I. INTRODUCTION

### A. Procedural History

On June 29, 1994, Eastern Edison Company ("Eastern" or "Company") filed with the Department of Public Utilities ("Department") an application for approval of a change in the Conservation Charge ("CC")[1] rates applicable to each rate class for the period September 1, 1994 through December 31, 1995. On July 19, 1994, the Company amended its application so that the proposed CCs would be applied for the period December 1, 1994 through December 31, 1995. As attachments to its filing, the Company submitted impact and process evaluations that were used to estimate savings from the Company's demand-side management ("DSM") programs. The savings estimates produced by the DSM impact evaluations are used by the Company and the Department for planning purposes and for determining the lost base revenue ("LBR") to be collected by the Company in a particular year. On December 1, 1994, the Company submitted revised CC schedules and supporting testimony and documentation requesting that new CCs be implemented beginning January 1, 1995.

On July 29, 1994, the Department issued an Order of Notice and directed the Company to publish said Notice in accordance with the Department's rules of practice and procedure. The Notice stated that the Department would conduct an investigation into the Company's filing and, on its own motion, into the Company's CCs and the various components of those charges. The Notice further stated that the Department would investigate issues related to the Company's DSM monitoring and evaluation ("M&E") reports. The Notice also stated that the Department intended to investigate alternative

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[1] The Company's filing refers to the Conservation Charge as the "Conservation Cost Adjustment Factor."

methodologies by which to calculate the LBR allowed for recovery by Eastern. The Notice established August 16, 1994 as the date for public hearing.

The following parties were granted intervenor status in this proceeding: the Attorney General of the Commonwealth ("Attorney General"); Cambridge Electric Light Company, Commonwealth Electric Company and Commonwealth Gas Company ("Commonwealth"); Fitchburg Gas and Electric Light Company ("FG&E"); and Western Massachusetts Electric Company ("WMECo"). Commonwealth, FG&E, and WMECo are all regulated utilities certified by the Department to provide electrical energy in Massachusetts.

The Company presented two witnesses in this case: Carol S. White and Donald M. Bishop in support of the Company's CC filing. No other party to the proceeding offered testimony. The record includes 83 exhibits submitted by the Company. The record also includes the Company's responses to 26 record requests issued during the course of the proceeding. The Department entered four additional exhibits into the record.

The Department held a public hearing and procedural conference in Boston on August 16, 1994. In addition, there were three days of evidentiary hearings on September 19, 21, and 29, 1994 held in Boston.

B. DSM Savings Estimation Techniques

The Department has not specified the savings estimation techniques to be used by companies in their impact evaluations. Instead, companies are allowed the flexibility to select techniques that they deem most appropriate, provided that the techniques satisfy the standards of review set forth in Section I.C., below. The impact evaluations that are the subject of this Order included a variety of savings estimation techniques, including

engineering estimates, billing analysis, end-use metering, load shape data, and surveys.[2]

As a general rule, the first step in developing energy and demand savings estimates consists of producing engineering estimates of annual savings, based on the number of energy conservation measures ("ECMs") installed. These estimates are called "tracking system" estimates. As stated in Section I.C., below, the Department generally has required companies to measure actual savings after the installation of the ECMs. Post-installation measurement techniques typically measure the savings for a sample of program participants in a particular year (the "participant group"). The savings estimates for the participant group then are extrapolated to the entire population of program participants. One frequently-used extrapolation method involves the calculation of a "realization rate" for the participant group. The realization rate is defined as the ratio of the measured savings estimates for the participant group to the engineering savings estimates for the same group. To calculate total program savings estimates, the engineering savings estimates for the entire population of program participants are multiplied by the realization rate.

In order for the Department to determine LBR and to satisfy the Department's standard of review for DSM impact evaluations, the savings estimates must (1) reflect annualized energy savings estimates[3] for each year of program implementation; (2) reflect an

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[2] For a generic description of these techniques, see Cambridge Electric Light Company/Commonwealth Electric Company, D.P.U. 94-2/3-CC at 9-18 (1994); Massachusetts Electric Company, D.P.U. 92-217-B at 7-16 (1994).

[3] Annualized savings are the savings due to measures installed throughout an implementation year that would occur if the measures were in place for the entire year.

estimate of actual savings for test year implementation and for any other implementation year for which LBR is requested; (3) reflect the level of demand savings that occurs at the time of, or coincident with, a company's peak power demand (i.e., "coincident" demand savings);[4] and (4) exclude the level of savings that would have occurred in the absence of implementation of the DSM programs (i.e., "net" savings estimates).[5]

C. Standard of Review

In Massachusetts Electric Company, D.P.U. 92-217-B, at 6 (1994), the Department introduced a new standard of review that would be applied to subsequent impact evaluations. The Department stated that, in order for a company's DSM savings estimates to be accepted, the company must demonstrate that its impact evaluations are reviewable, appropriate, and reliable.[6] Id.

An impact evaluation filing is considered reviewable if it is complete, clearly presented, and contains a summary that sufficiently explains all assumptions and data

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[4] Savings estimates that do not reflect separately the level of demand savings that occur at the time of a company's peak power demand are referred to as "non-coincident" demand savings estimates.

[5] Savings estimates that do not take into account the level of savings that would have occurred in the absence of implementation of the DSM programs are referred to as "gross" savings estimates. To determine net savings estimates, gross savings estimates must be adjusted for non-program factors that may affect the electricity consumption of program participants, such as free-ridership, economic conditions, weather, spillover, and snap-back.

[6] In D.P.U. 92-217-B, at 6, the Department stated that this standard of review "reflects the criteria that have been established for the review of electric companies' demand forecasts. This is appropriate because, as with electric demand forecasts, DSM impact evaluations employ input data and complex methodological techniques to develop assessments that are important to the utilities' resource planning processes and to ratepayer costs."

presented. Id. An impact evaluation is considered appropriate if evaluation techniques selected are reasonable given consideration of the characteristics of a particular DSM program, the company's resources, and the available methods for determining demand and energy savings estimates.[7] Id. at 6-7. Finally, an impact evaluation is considered reliable if the savings estimates included in the evaluation are sufficiently unbiased and are measured to a sufficient level of precision, again, given consideration of the characteristics of a particular DSM program, the company's resources and the available methods for determining demand and energy savings estimates. Id. at 7.

The Department previously has found substantial bias in engineering estimates of DSM savings and, accordingly, has generally required companies to measure savings after the installation of ECMs. Boston Edison Company, D.P.U. 90-335, at 106 (1992) ("BECo"); Nantucket Electric Company, D.P.U. 91-106/138, at 212-215 (1991); Massachusetts Electric Company, D.P.U. 90-261, at 79, 80, 85 (1991) ("D.P.U. 90-261"); Western Massachusetts Electric Company, D.P.U. 91-44, at 142-143 (1991) ("WMECo"). The Department has identified additional sources of bias in savings estimates, including: (1) poor selection of samples used in savings measurement analyses, WMECo at 138; (2) inaccurate hours-of-use estimates, BECo at 105; WMECo at 142; D.P.U. 90-261, at 109-110; (3) the failure to account for free riders, BECo at 111-112; (4) the failure to account for interactions of multiple DSM measure installations, Cambridge Electric Light

[7] The Department recognizes that the state-of-the-art in methods used to determine DSM savings estimates is evolving and expects electric companies to remain up to date with technological and methodological advances in this field.

Company and Commonwealth Electric Company, D.P.U. 89-242/246/247, at 78-79 (1990); and (5) overestimated persistence of savings. BECo at 110-111; WMECo at 147-148.

With respect to the precision of savings estimates, the Department recognizes that, in certain instances, the costs of obtaining more precise estimates of savings may exceed the incremental value of those more precise estimates. See D.P.U. 90-261, at 100. Therefore, the Department directs companies to pursue savings measurement activities that maximize the level of precision of the DSM savings estimates, but only to the extent that the marginal value of the more precise savings estimates exceeds the marginal cost of obtaining the additional precision. See BECo at 100-103, 110; D.P.U. 90-261, at 106, 108.

D. Reviewability

As stated in the standard of review, above, a company's impact evaluation filing is considered reviewable if it is complete, clearly presented, and contains a summary that sufficiently explains all assumptions and data presented. Although the Company presented a summary of its savings estimates, that summary did not include a sufficient explanation of how those savings estimates were derived from the process and impact evaluations. However, because the standard described above was set forth in D.P.U. 92-217-B, issued on May 20, 1994, the Company did not have adequate time to comply with this standard before submitting its filing in June 1994. Therefore, for purposes of this proceeding, the Department accepts the Company's filing for review but in the future expects the Company to submit a filing that satisfies the criteria for reviewability set forth above.

In addition, the Company filed revised CCs on December 1, 1994,[8] which include values for net energy savings producing LBR in 1993 that differ slightly from those values presented in the June 1994 CC filing (Exhs. EE-1; DPU-1, at 17). The Company provided an explanation of the modified values in a supplemental filing (Exh. EE-1, Supp.).

## II. DSM PROGRAM EVALUATIONS

### A. Commercial and Industrial Retrofit Program

#### 1. Program Description

In 1991, the Company began implementation of the Commercial and Industrial ("C/I") Retrofit Program, which is designed to serve both small and large commercial, industrial, and institutional customers (Exh. DPU-4, at II-19).[9] The program provides rebates for the installation of a variety of energy conservation measures including lighting; water heating; motors; and heating, ventilation, and air conditioning ("HVAC") equipment (Exh. EE-1, Att. CSW-1, at ES-2, Att. CSW-2, at i). The program is promoted as a part of the Company's "Energy Solutions" effort and is marketed through three approaches: direct

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[8] Pursuant to C.M.R. 220 § 1.10(3), "Documentary Evidence: Incorporation by Reference," the Department offers and enters into the record as Exhibit DPU-1 the Company's December 1, 1994 "Conservation Cost Adjustment Filing, December 1994" which was filed by the Company under the provisions of its tariff M.D.P.U. No. 279, for approval of a change in the Conservation Cost Adjustment Factor applicable to each Rate Schedule for the period January 1, 1995 through December 31, 1995. All parties to the proceeding have been notified of this offer and incorporation into the record by reference and have no objections.

[9] Pursuant to C.M.R. 220 § 1.10(3), "Documentary Evidence: Incorporation by Reference," the Department offers and enters into the record as Exhibit DPU-4 the Company's 1993 Conservation and Load Management Annual Report, filed with the Department on September 22, 1994. All parties have been notified of this incorporation into the record by reference and have no objections.

contact by the Company's Consumer Services staff, direct marketing through letters, and telemarketing (Exh. EE-1, Att. CSW-1, at ES-3).

2. Evaluation Description

The Company performed an impact evaluation of this program using information from the 1991 and 1992 participants (Exh. EE-1, Att. CSW-2, at 6). The Company employed two separate analysis techniques, described below, to determine savings estimates: the Engineering Calibration Approach ("ECA"), and a billing analysis (id. at 3). The Company had planned to combine the results as described in the Executive Summary of the impact evaluation (id., at Ex-1). However, because of several perceived limitations, the Company rejected the results of the billing analysis (id. at 42-43). The Company reported that realization rates derived from the ECA analysis were applied to the estimates from their tracking system for 1992 and 1993 to derive the savings estimates for these years (Exh. EE-1, Att. CSW-2, at vii; Tr. 2, at 93).

a. ECA Evaluation Method

The ECA evaluation combined on-site survey information, end-use metering, and tracking system estimates to develop realization rates (Exh. EE-1, Att. CSW-2, at 15). The sample size, design, and selection of participants for the on-site surveys and metering were determined through statistical techniques[10] (id. at 5-6). The statistical techniques combined with a preliminary analysis of 18 projects resulted in a final sample of 63 projects. A

[10] The sample size was determined through a formula that incorporated an error ratio and the desired level of precision (id. at 5). For the design of the survey and end-use metering samples, the Model-Based Statistical Sampling (MBSS) System was employed (id. at 6).

comprehensive engineering assessment was performed on these 63, and one project was utilized for a motor savings analysis only (id. at 6). From the sample of the remaining 62 projects, a stratified sample of 24 customers was selected for end-use metering for a more complete lighting analysis[11] (id. at 7). Lighting loggers were installed several weeks before and were removed several weeks after retrofitting to determine savings estimates (id. at 12-13).

The Company stated that connected demand savings[12] estimates were developed through its tracking system using spot metering data collected during site visits (id. at 23, 26-27). Realization rates for winter and summer peak demand savings were then developed using end-use metered hourly profile data compared to tracking system connected demand savings estimates, incorporating seasonal difference (id. at 26-27).

The Company stated that a realization rate for each end use was developed by multiplying the ratio of the on-site survey-based savings estimates for the 63 sites to tracking system estimates of savings for those same sites by the ratio of metered results for the 24 metered sites to on-site survey-based estimates of savings for those same 24 sites (id. at 25; Tr. 2, at 81). The resultant realization rate of 86.6 percent for lighting measures with a relative precision of ±13.5 percent, which accounted for 91 percent of savings achieved in

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[11] Because 91 percent of total program savings were achieved by lighting measures (id. at 7), the Company's approach emphasized the determination of savings from lighting-dominated projects (id. at 11).

[12] Connected demand savings refers to the difference between the rated wattage of standard equipment and the wattage of the installed higher efficiency equipment (Exh. DPU-1-6).

this program, was applied to the tracking estimates to develop gross savings estimates for the program population (Exh. EE-1, Att. CSW-2, at 25-26, 29, 33). When the results of the non-lighting measure analyses were incorporated, the resultant gross realization rate was 91.5 percent with a relative precision of ±12.3 percent (id. at 33).

In order to determine net savings estimates, the Company developed free-rider rates for each end use based on the answers to one question in a survey conducted as part of a process evaluation[13] (Exh. EE-1, at 10). For lighting measures, the survey results showed that eight percent of the participants were free riders (Exh. EE-1, Sch. CSW-1). Thus, the gross savings estimates for lighting measures were adjusted by that factor (id.). For non-lighting measures, the survey results showed that 5.6 percent of HVAC participants were free riders; 30 percent of motors participants were free riders; and 27.3 percent of hot water heater participants were free riders (Exh. EE-1, Att. CSW. 1, at III-30). However, the Company reported that it did not use these non-lighting free-rider rates because the sample size was too small to apply the results to the total population (Tr. 2, at 83). Instead, the Company stated that it applied a free-rider rate of 12 percent to its non-lighting savings estimates, based on published results from another local electric company (Exh. EE-1, at 10; Tr. 1, at 88).

The Company stated that persistence is implicitly contained in the realization rates

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[13] Although the question listed five options for response, only those participants who answered that they would have purchased the same energy efficient equipment in the absence of the program were counted as free riders (Exh. EE-1. Att. CSW-1, at III-29).

developed in the impact evaluation of this program (Exh. DPU-1-8).[14] The Company reported that the results of a persistence study for this program should be available in the first quarter of 1995, and that the savings estimates from 1992 and 1993 installations will be adjusted in future years based on the results of the persistence study (id., Tr. 1, at 40). Finally, a net realization rate of 83.7 percent with a relative precision of ±12.3 percent was developed, taking into account free riders and persistence (Exh. EE-1, Att. 2, at 33).

b. Billing Analysis

The Company reported that the billing analysis included all 1992 C/I Retrofit Program participants with available and complete data that did not reflect extreme variability in usage, missing or zero values for savings, or other anomalous data (Exh. EE-1, Att. CSW-2, at 35, 38).[15] A comparison group was developed by matching non-participants to participants using three factors: company designation (i.e., Eastern Edison, Newport Electric Company, or Blackstone Valley Electric Company); revenue code (designating commercial or industrial customer); and average monthly usage (id. at 35).[16] The Company reported that the evaluator explored several model configurations and chose a final model to determine post-period consumption based on pre-period consumption and the net engineering estimate of savings as variables (id. at 39-41). The Company stated that the coefficient of the

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[14] The Company claims that the post-retrofit survey performed as a part of the ECA analysis accounts for persistence up to the date of each survey (Exh. DPU-1-8).

[15] After data screening, data on a total of 177 participants were available for cross-sectional regression analysis (Exh. EE-1, Att. CSW-2, at 39).

[16] After data screening, data on a total of 433 non-participants were available for inclusion in the comparison group (Exh. EE-1, Att. CSW-2, at 39).

engineering estimates of savings resulted in a realization rate of 61.2 percent with a relative precision of ±13.8 percent (id.).[17]

c. Determination of Final Savings Estimates

The Company noted a number of limitations associated with the billing analysis -- primarily, a small sample and a lack of data for non-participants[18] -- and stated that the results are likely to be biased because of these limitations (id. at 41-42). The Company also noted two potential sources of bias for the ECA analysis: the limited duration of the on-site metering used to develop hours-of-use estimates for the energy conservation measures and the small size of the participant sample (Exh. EE-1, Att. CSW-2, at 42, 44).[19] Nonetheless, based on the recommendation of the evaluator who performed the impact evaluation, the Company decided not to statistically pool the results of the billing analysis with the results of the ECA, but rather to use the ECA results only (id. at 43).

The Company is not requesting LBR for 1991 for this program because C/I customers were being served by another program during 1991 (see discussion of discontinued programs in Section II.G., below) (Exh. DPU-1, at 17).

Based on the results of the ECA analysis and the process evaluation, the Company determined that a total of 137 Eastern customers participated in the C/I Retrofit Program in

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17 Free-ridership and persistence are implicitly accounted for in a billing analysis.

18 The Company did not conduct a non-participant survey (Exh. EE-1, Att. CSW-2, at 45; Tr. 2, at 103).

19 Other shortcomings of the ECA analysis include the small sample sizes for several non-lighting measures (Tr. 2, at 83), and the fact that the sample did not cover refrigeration or custom measures (Tr. 2, at 93-92).

1992 (Exh. DPU-RR-1), achieving estimated annualized energy savings of 4,614,472 KWH (Exh. EE-1, Schedule CSW-1). The Company presented estimated demand savings from 1992 installations for this program of 1,276 KW in summer and 850 KW in winter (id.).

The Company also determined that a total of 501 Eastern customers participated in the C/I Retrofit Program in 1993 (Exh. DPU-RR-1), achieving estimated annualized energy savings of 12,558,350 KWH (Exh. EE-1, Schedule CSW-1). The Company presented estimated demand savings from 1993 installations for this program of 3,189 KW in summer and 2,123 KW in winter (id.).

3. Analysis and Findings

The record shows that the 1992 and 1993 savings estimates for the C/I Retrofit Program are based on the results of on-site surveys, end-use metering, and tracking system estimates (See Section II.A.2.a., above). However, this ECA analysis was limited by (1) the limited duration of the on-site metering used in developing hours-of-use for the energy conservation measures, (2) the small sample size of participants, (3) the exclusion of refrigeration and custom measures, and (4) the small sample sizes for several non-lighting measures. In addition, the survey-based free-rider adjustment was limited by the use of a single survey question, which did not delve fully into participants' motivations for installing measures, and did not attempt to measure partial free riders. Further, the Company did not adequately support its decision to import free-rider adjustments for non-lighting measures from another utility. Despite the weaknesses identified in the ECA analysis, none of the deficiencies mentioned above would lead to obvious bias in either direction.

The record also indicates that the Company performed a billing analysis for this

program but rejected the results of the billing analysis (see Section II.A.2.b., above). While the Company cited the small size of the sample and the inability to incorporate customer data, particularly non-participant data, as reasons to reject the billing analysis,[20] the Company has not presented any evidence to suggest that these limitations lead to clear bias in one direction or another. Therefore, the Department concludes that the problems surrounding the billing analysis also raise questions regarding reliability, but do not represent instances of clear bias.

When correctly applied, both techniques described above previously have been found by the Department to be reliable methods of estimating savings for this type of program. See Western Massachusetts Electric Company, D.P.U. 94-8-CC (Phase II) at 12, 15-16 (1994). When more than one savings estimation technique is applied to a particular program, the Department has directed companies to reconcile differences in savings estimates. See Fitchburg Gas and Electric Light Company, D.P.U. 92-181-A at 43 (1994). The Department finds that the deficiencies in the ECA and billing analyses are comparable, and that the results are sufficiently unbiased. Therefore, the Company should not have rejected the results of the billing analysis but should have combined the results of the two studies. Accordingly, the Department directs the Company to pool the results of the ECA and billing analyses, weighing each study's results equally, because (1) the relative precisions of the results of the two methods are comparable, and (2) no evidence was presented regarding the relative weights of the two studies. Based on this pooling, the Company is directed to

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[20] The Department notes that the Company failed to collect the data necessary to perform a more robust billing analysis (See Section II.A.2.c., above).

recalculate the energy and demand savings estimates for its C/I Retrofit Program and the LBR associated with these estimates, and to submit them to the Department in a compliance filing to this Order.

In addition, the Company's claim that persistence in the short run is implicitly accounted for in the impact evaluation is supported by the record. Therefore, for purposes of calculating LBR in this proceeding, the Department accepts the treatment of persistence for savings for C/I Retrofit program implementation in 1992 and 1993 and directs the Company to implement its plans to refine persistence figures in future years.

B. C/I Efficient Construction Program

1. Program Description

The C/I Efficient Construction program provides incentives based on the incremental cost of high-efficiency design and building practices during construction of a new building, renovation of an existing building space, or installation of new equipment (Exh. EE-1, at 4-5). The program was available to all commercial, industrial and institutional customers (id. at 4). Also, since 1993, construction and renovation of multifamily dwellings not covered by the Energy Crafted Home program have been eligible for this program (id., Att. CSW-3, at 1).

The C/I Efficient Construction program offers two implementation strategies: a "menu driven" prescriptive measure approach; and an "interactive" comprehensive approach that is marketed to customers with buildings larger than 50,000 square feet (id.). The prescriptive measure approach offers the customer a list of specific measures and their

respective rebates (id.).[21] The comprehensive approach is designed to maximize conservation in a comprehensive and interactive manner relying on architects, engineers and computer models to evaluate all potential design and construction options (id. at 1-2).

2. Evaluation Description

The Company conducted an impact evaluation to calculate the energy and capacity savings associated with the C/I Efficient Construction program (id. at 38). The impact evaluation combined on-site data with engineering estimates to determine the estimated actual savings for 20 of the 53 participant projects completed through June 1993 (id.).[22] This representative sample was selected based on the demand level of each participant, putting greater weight on the program participants with greater expected savings levels (id.). The sample was then segmented into four strata to represent the heterogeneity of the participant population (id.).

Site visits with customers in the participant sample yielded data on building and equipment operating characteristics (id.). In addition, meters were used to determine site-specific demands and operating hours for the equipment that was installed as part of the program (id.).

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[21] Within the prescriptive measure approach, two methods are available for determining rebates for energy efficient lighting measures: the building code method and the specific fixture method. Rebates under the building code method are based on a watts-per-square-foot reduction. Rebates under the specific fixture method are predetermined for each type of fixture (Exh. EE-1, Att. CSW-3, at 1).

[22] One project using Thermal Energy Storage technology was determined to be unique in that its focus was demand reduction instead of energy savings (Exh. EE-1, Att. CSW-3, at 41). The sampling methodology used the remaining 52 projects as the program population from which to design the sample (id.).

In order to estimate what equipment would have been installed absent the program, construction baseline practices in the EUA service territories were evaluated (id.). Information from site visits to 15 non-participant facilities was used to define lighting practices (id.). Air conditioning and refrigeration baselines were determined from two recent studies that were completed for a consortium of New England utilities (id.).

The Company also made adjustments to gross savings estimates based on estimates of free riders, free drivers, snapback and persistence (id. at 50-53). Free-ridership levels were based on participants' responses to three questions associated with the likelihood that the participants would have installed the measures on their own without Eastern's program or with lower rebate levels (id. at 52). The Company calculated 5 percent to 32 percent free-rider rates based on specific measures (id.). For lighting measures, which comprise 69 percent of the program savings, the Company calculated a 19 percent free-rider rate (id.).

Regarding free-drivership, snapback and persistence levels, the Company determined that the information available was insufficient to quantify any of these factors with significant statistical precision (id. at 52, 53). Therefore, no adjustment was made to gross savings estimates to account for free drivers, snapback or persistence (id.).

The Company calculated that the C/I Efficient Construction program produced energy savings of 592 MWH in 1992 and 755 MWH in 1993 for a total effect of 1,347 MWH in 1993 from 1992 and 1993 installations (Exh. EE-1, Sch. CSW-2). The Company also calculated that implementation of the program during 1992 and 1993 produced demand savings of 376 KW in the summer of 1993 and 131 KW in the winter of 1993 (id.).

3. Analysis and Findings

The record indicates that the Company calculated net energy savings estimates based on a representative sample of participants. The record also indicates that, in order to determine the baseline energy usage, the Company conducted site visits of non-participant facilities and relied on reports of baseline efficiencies implemented in the New England region. The Department finds this methodology appropriate. The Department also finds that the Company's analysis was well-documented, and that the savings estimates are sufficiently unbiased and precise. Therefore, the Department accepts the savings estimates for 1992 and 1993 implementation of the C/I Efficient Construction program as reliable for purposes of calculating LBR, consistent with any modifications required by the Department in Section IV.A.2.

C. Single Family Retrofit Program

1. Description

The Company began implementation of the Single Family Retrofit ("SFR") Program in 1991 (Exh. DPU-4, at II-3). The program is designed to encourage the installation of energy efficient equipment in existing homes, targeting three single family markets: (1) customers with electric space heat; (2) customers with electric water heating; and (3) general use customers (Exh. EE-1, Att. CSW-4, Vol. 1, at 1.1). The Company markets the program by offering to install, free of charge, energy conservation measures that provide immediate savings to all customers and all cost-effective insulation and infiltration improvements for electric space heating customers (id. at 1.6).

The Company did not complete an impact evaluation for this program before the close

of the record but reported that an impact evaluation for this program will be finalized by the end of 1994 and will be submitted to the Department as part of its next M&E filing (Tr. 2, at 76). The Company stated that plans to conduct program evaluations every other year were developed in cooperation with interested parties in Massachusetts and Rhode Island, including Department staff and the Office of the Attorney General, and are consistent with plans included in the C&LM Annual Report filing to the Federal Energy Regulatory Commission ("FERC")[23] (Exhs. DPU-2[24]; DPU-3[25]). The Company identified the cost burden as the

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[23] On August 20, 1993, EUA entered into a Memorandum of Understanding ("MOU"), under which DSM program plans and budget review and approval will be moved from FERC to the states beginning with expenses incurred under 1996 programs (MOU at 10-11). The MOU was approved by the Department on August 25, 1993 in D.P.U. 93-157.

[24] Pursuant to C.M.R. 220 § 1.10(3), "Documentary Evidence: Incorporation by Reference," the Department offers and enters into the record as Exhibit DPU-2 the Company's October 31, 1993 report entitled "Conservation and Load Management Annual Report Information Filing and Projected Revenue Requirements -- October 31, 1993" which was filed with the Department on November 1, 1993, describing the activities performed by Montaup in designing, implementing, monitoring and evaluating Conservation and Load Management ("C&LM") programs as part of a cooperative effort at the state level in Massachusetts and Rhode Island. This informational filing is required under the revised C&LM clause which was approved by the FERC in Docket No. ER93-79-000 on May 4, 1993, and which is contained in Montaup's wholesale rate schedules for services to its retail distribution affiliates, Eastern Edison Company in Massachusetts and Blackstone Valley Electric Company and Newport Electric Corporation in Rhode Island. All parties have been notified of this incorporation into the record by reference and have no objections.

[25] Pursuant to C.M.R. 220 § 1.10(3), "Documentary Evidence: Incorporation by Reference," the Department offers and enters into the record as Exhibit DPU-3 the Company's November 1, 1994 report entitled "Conservation and Load Management Annual Report Information Filing and Projected Revenue Requirements -- October 31, 1994," which was filed with the Department on October 31, 1994, pursuant to FERC. All parties have been notified of this incorporation into the record by reference and have no objections.

primary reason for not conducting impact evaluations of all programs each year (Tr. 1, at 16).

The Company is requesting LBR for 50 percent of annualized savings estimates for 1991, equal to 768,868 KWH for this program, to approximate the portion of savings not included in the Company's 1991 test year sales level upon which the Company's base rates were set (Exh. DPU-1, at 17).

The Company reported savings estimates for 1992 and 1993 based on a combination of estimates from their tracking system and the results of a survey performed as part of a process evaluation of this program (Exh. EE-1, at 17; DPU-1-5).[26] The tracking estimates utilized information gathered through site visits: (1) the quantity of measures installed; (2) the types of measures installed; and (3) wattage information on the original equipment (Exhs. DPU-2-16, DPU-3-7). The Company developed measure-specific free-rider rates by using the results of a telephone survey of participating customers (Exh. EE-1, Att. CSW-4, Vol. 1, at 9.1).[27] The Company developed measure-specific persistence rates using the results of telephone surveys and of on-site visits with participating customers (id. at 7.1).[28]

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[26] The process evaluation included an assessment of implementation from the inception of the program in March 1991, through December 1992 (Exh. EE-1, Att. CSW-4, Vol. 1, at 2.1).

[27] Free-rider rates for measures installed as part of this program are as follows: Lighting - 16 percent; Electric Water Heating - 6 percent; Weatherization - 11 percent; A/C Filter Clean/Replacement - 71 percent; and Refrigerator Coil Cleaning - 41 percent (Exh. EE-1, Sch. CSW-3).

[28] Persistence rates for measures installed as part of this program are as follows: Lighting - 84 percent; Electric Water Heating - 90 percent; Weatherization - 100 percent; A/C Filter Clean/Replacement - 100 percent; and Refrigerator Coil Cleaning - 90 percent (Exh. EE-1, Sch. CSW-3).

The Company applied these free-rider and persistence rates to tracking estimates for 1992 and 1993 to determine savings estimates for program implementation in these years (Tr. 1, at 35-38).

The Company reported that, in 1992, a total of 4,120 Eastern customers participated in the SFR Program (Exh. DPU-RR-1), achieving estimated annualized energy savings of 3,205,780 KWH (Exh. EE-1, Sch. CSW-3). The Company presented estimates of demand savings from 1992 installations of 244 KW in summer and 859 KW in winter (id.).

In 1993, a total of 4,502 Eastern customers participated in the SFR Program (Exh. DPU-RR-1), achieving estimated annualized energy savings of 3,668,843 KWH (Exh. EE-1, Sch. CSW-3). The Company presented estimates of demand savings from 1993 installations of 190 KW in summer and 895 KW in winter (id.).

2. Analysis and Findings

Regarding the Company's plan to conduct impact evaluations only every other year, the record shows that the Company's impact evaluation schedule is consistent with its C&LM Annual Report filed with the FERC, which has jurisdiction over the Company's DSM program planning until 1996. The record also shows that the Company quantified free-rider rates and persistence rates by measure type through surveys conducted as part of a process evaluation, and incorporated the results into its savings estimates. Consistent with the finding in Section III.C.3., below, the Department accepts the savings estimates presented herein for the SFR Program for recovery of LBR in 1995. However, the Department directs the Company to recalculate the 1992 and 1993 savings estimates based on the results of the impact evaluation that will be submitted in the Company's next M&E

filing, and directs the Company to reconcile the recovery of LBR in 1996 based on the results of the revised estimates.

D. Multifamily Program

1. Description

The multifamily component of the Residential Retrofit program ("Multifamily Program") was designed to encourage the installation of energy conservation measures in existing multifamily buildings with five or more units (Exh. EE-1, at 5). The program targets electric space heating, water heating, and lighting applications in tenant and common areas (id.). The program encompasses a variety of implementation strategies including energy audits, direct installation of ECMs, energy management training, and sales of ECMs through a mail-order catalogue and retailer rebates (id., Att. CSW-4, Vol. 2, at 1.6). In 1992, Eastern offered services through the Multifamily Program free-of-charge to all participating customers (id. at 1.7). In 1993, Eastern required cost-sharing by participating customers for common area and exterior lighting measures equal to the value of one year of energy savings for the average participant (id.).

The Company submitted a process evaluation of the Multifamily Program as part of its initial filing (id., Att. CSW-4, Vol. 2).[29] The process evaluation consisted of interviews with Company personnel involved in program marketing, implementation, and evaluation; interviews with the implementation contractor; review and analysis of the program tracking

[29] On November 29, 1994 (i.e., after the close of hearings), the Company submitted the Multifamily Program impact evaluation in response to the Department's first supplemental record request (Exh. DPU-S-1(R)).

database; telephone surveys and site visits with program participants; and an analysis of the marketing strategies used to promote the program (id. at iv). Through the process evaluation, the Company determined that participating customers were successfully recruited through direct marketing by the implementation contractor, although additional marketing strategies, such as bill enclosures and mass media advertising, were recommended (id. at 9.2). The Company also concluded that, although certain program delivery bottlenecks occurred, the program received high customer acceptance and satisfaction (id. at 9.2-9.3). The Company also estimated free-ridership levels for weatherization, water heating, and lighting measures, based on customer self-reported data obtained during telephone surveys (id. at 9.6).

Finally, the process evaluation contained recommendations regarding program design, marketing, delivery, and evaluation of savings estimates (id. at 9.8-9.13). Specifically, the process evaluation recommended that the Company carefully monitor participation levels in light of Company goals; minimize program delivery backlog; evaluate the customer contribution requirement on program participation and measure penetration; modify, as necessary, air-sealing guidelines; and improve evaluation of savings persistence (id.).

The Company is requesting LBR for 50 percent of annualized savings estimates for 1991, equal to 136,044 KWH for this program, to approximate the portion of savings not included in the Company's 1991 test year sales level upon which the Company's base rates were set (Exh. DPU-1, at 17).

The Company estimated that through the implementation in Eastern's service territory of the Multifamily Program, 3,931 units were treated in 1992 and 23,018 units were treated

in 1993 (id. at 2.11). The Company estimated, based on an impact evaluation submitted to the Department subsequent to hearings, that the Multifamily Program produced energy savings in 1993, for which they seek LBR recovery, of approximately 136,000 KWH from 1991 installations, 1.9 million KWH from 1992 installations, and 1.0 million KWH from 1993 installations (Exh. DPU-1, at 17). The Company also estimated that the Multifamily Program produced energy savings in 1994, for which they seek LBR recovery, of approximately 1.8 million KWH from 1992 installations, and 2.0 million KWH from 1993 installations (id.).

2. Analysis and Findings

The Department notes that the Company's savings estimates were based on an impact evaluation that was not subject to Department review, and that the impact evaluation will be subject to Department investigation in the Company's next DSM M&E filing. The Department finds that the Company's savings estimates are consistent with Department precedent concerning "first look" savings estimates as established in Western Massachusetts Electric Company, D.P.U. 91-44, at 108-109. See Section III.C, below. Therefore, the Department accepts the savings estimates for the Multifamily Program presented herein for purposes of calculating LBR.

E. Residential Efficient Lighting Program

1. Description

In March 1991, the Company began implementation of the Residential Efficient Lighting Program, which consists of the Mail Order Catalog and Retailer Rebate Components (Exh. EE-1, Att. CSW-4, Vol. 3, at i). The program is designed to offer

residential customers efficient lighting products at subsidized prices (id.). The program is marketed primarily through bill enclosures and special promotions (id. at i, ii).

The Company did not conduct an impact evaluation for this program, but stated that it may conduct an impact evaluation next year if the costs of doing so are not prohibitive (Tr. 1, at 18, 19). However, as a part of the persistence study of this program that the Company is currently conducting, some end-use metering will be performed and the results of the persistence study will be used in the reconciliation of savings estimates that will be presented in a future filing (Tr. 1, at 17, 24). The Company stated that all plans for the conduct of program evaluations were developed in cooperation with interested parties in Massachusetts and Rhode Island, including Department staff and the Office of the Attorney General, and are consistent with plans included in the C&LM Annual Report filings to the FERC (Exhs. DPU-2; DPU-3). However, the record is inconsistent in that the 1994 FERC filing indicates that the Company will complete an impact evaluation of this program by October of 1995 (Exh. DPU-3, at 75).

The Company reported savings estimates for 1992 and 1993 program installations based on a combination of tracking estimates and the results of surveys conducted as part of a process evaluation of this program (Exh. EE-1, at 20, Sch. CSW-5). Through surveys of 1991 and 1992 program participants, the Company developed a free-rider rate of 15 percent for lighting measures (Exh. EE-1, Att. CSW-4, Vol. 3, at 8.6). Through similar surveys of these participants, the Company developed a persistence rate of 74 percent for lighting measures (id. at 6.3). The Company applied these rates for free riders and persistence to tracking estimates for 1992 and 1993 installations to determine savings estimates for these

years (Exh. EE-1, at 20, Schedule CSW-5).

The Company is requesting LBR for 50 percent of annualized savings estimates for 1991, equal to 76,660 KWH for this program, to approximate the portion of savings not included in the Company's 1991 test year sales level upon which the Company's base rates were set (Exh. DPU-1, at 17).

The Company stated that, in 1992, a total of 9,376 Eastern customers participated in the Residential Efficient Lighting Program (Exh. DPU-RR-1), achieving estimated annualized energy savings of 1,649,102 KWH (Exh. EE-1, Sch. CSW-5). The Company presented estimated demand savings from 1992 installations of 168 KW in summer and 560 KW in winter for this program (id.).

The Company stated that in 1993, a total of 4,617 Eastern customers participated in the Residential Efficient Lighting Program (Exh. DPU-RR-1), achieving estimated annualized energy savings of 598,839 KWH (Exh. EE-1, Sch. CSW-5). The Company presented estimated demand savings from 1993 installations of 60 KW in summer and 230 KW in winter for this program (id.).

2. Analysis and Findings

Regarding the Company's plan to not conduct an impact evaluation of the Residential Efficient Lighting Program in 1994, the record shows that the Company's impact evaluation schedule is consistent with its C&LM Annual Report filed with the FERC, which has jurisdiction over the Company's DSM program planning until 1996. However, with regard to the Company's plan to conduct an impact evaluation of this program in 1995, the record is inconsistent in that the Company stated that it may not conduct an impact evaluation of this

program next year, but also presented a plan that indicated in its 1994 C&LM Annual Report filing with the FERC that an impact evaluation will be completed by October 1995. Consistent with the finding in Section III.C.3., below, for purposes of this proceeding only, the Department accepts the savings estimates presented herein. However, the Department directs the Company to recalculate the 1992 and 1993 savings estimates based on the results of the persistence study that will be submitted in the Company's next M&E filing and further directs the Company to reconcile the recovery of LBR associated with implementation of the 1992 and 1993 this program in 1996. In addition, consistent with the Company's 1994 C&LM Annual Report filing with the FERC, the Department directs the Company to perform an impact evaluation in 1995 unless the Company can demonstrate that the cost of doing so would be excessive.

F. Energy Crafted Home Program

1. Description

The Company began implementation of the Energy Crafted Home ("ECH") program in 1991 (Exh. DPU-4, at II-11). The program is designed to promote energy-efficient new home construction by providing financial incentives ranging from $25 to $2,800 for measures that meet the program's construction standards (id. at II-10, 11). The program is marketed through mailings targeted to builders, home buyers, realtors, and lenders, and through public relations activities (id., at II-10).

The Company did not conduct an impact evaluation for this program but is planning to conduct a residential construction baseline study in conjunction with other electric companies (Tr. 1, at 19). The Company stated that the results of the baseline study will aid

in the determination of savings estimates for this program (id. at 19, 20). Because of the low participation rate in the program, the Company does not plan to conduct an impact evaluation of this program (Tr. 1, at 19). The Company stated that all plans for the conduct of program evaluations were developed in cooperation with interested parties in Massachusetts and Rhode Island, including Department staff and the Office of the Attorney General, and are consistent with plans included in the C&LM Annual Report filings to the FERC (Exhs. DPU-2; DPU-3).

The Company reported savings estimates for 1992 and 1993 program installations based on the difference in energy and load requirements between an ECH Program home and a hypothetical home built to current Massachusetts building code, as reflected in a building simulation model that incorporated relevant data regarding the end uses in each home, the size of the dwellings, and other factors (Exh. EE-1, at 22). The Company used a free-rider rate of 0 percent and a persistence rate of 100 percent based on rates determined and reported by Massachusetts Electric Company for implementation of a similar program (id. at 21).

The Company stated that, in 1992, a total of four Eastern customers participated in the ECH Program (Exh. DPU-RR-1), achieving estimated annualized energy savings of 4,991 KWH (Exh. EE-1, Sch. CSW-5). The Company presented estimated demand savings from 1992 installations of 9 KW in summer and 1 KW in winter for this program (id.).

The Company stated that, in 1993, a total of three Eastern customers participated in the ECH Program (Exh. DPU-RR-1), achieving estimated annualized energy savings of 20,821 KWH (Exh. EE-1, Sch. CSW-5). The Company presented estimated demand savings

from 1993 installations of 8 KW in summer and 10 KW in winter for this program (id.).

2. Analysis and Findings

Regarding the Company's plan not to conduct an impact evaluation of the ECH program in 1994, the record shows that the Company's impact evaluation schedule is consistent with its C&LM Annual Report filed with the FERC, which has jurisdiction over the Company's DSM program planning until 1996. The record indicates that in lieu of an impact evaluation, the Company developed savings estimates for this program based on a building simulation model that incorporated data on end uses, size of dwelling, and other factors unique to each home that participated in the ECH Program in Eastern's service territory. Consistent with the finding in Section III.C.3., below, and for purposes of this proceeding only, the Department accepts the savings estimates presented herein. However, the Department directs the Company to reconcile the 1992 and 1993 savings estimates for the ECH Program based on the results of the residential baseline study that will be conducted with other electric companies and to adjust the recovery of LBR associated with implementation of the 1992 and 1993 Energy Crafted Home Program in 1996. In addition, the Department directs the Company to analyze the feasibility of performing, in conjunction with other utilities, an impact evaluation of this program and to perform an impact evaluation in 1995 or to demonstrate why such an evaluation is not feasible.

G. Savings Estimates for 1991 Implementation of Discontinued Programs

In the December 1, 1994 filing, the Company presented savings estimates for 1993 from the implementation of programs in 1991 that were subsequently terminated or combined with other programs (Exhs. DPU-1, at 17; DPU-4). The Company presented annualized

savings estimates for the Residential Electric Water Heating Conservation Program (WRAP) of 99,625 KWH; the Efficient Air Conditioning Program (AIRCON) of 120,100 KWH for residential customers and 47,918 KWH for C/I customers; the C/I Calculated Rebate Program (BONUS) of 1,161,354 KWH; and the C/I Efficient Lighting Program (BRITE) of 9,783,102 KWH (Exhs. DPU-1, WP-3; DPU-4). On December 14, 1994, the Company provided supporting documentation for the above-described savings estimates (Exh. EE-1, Supp.). The Company indicated that the net savings for the discontinued programs have been derived by applying end-use evaluation results of ongoing DSM programs to the gross savings for similar end-uses that were installed in the discontinued programs (id. at 4).

Because the Department did not accept the savings estimates for the C/I Retrofit Program as presented by the Company, as specified in Section II.A., above, and because the savings estimates of the discontinued programs are based on the results of impact evaluations of ongoing DSM programs, the Department cannot accept the savings estimates for discontinued C/I programs. The Department notes that the record is not clear as to how the Company applied the C/I Program realization rate to the discontinued DSM programs. Therefore, as part of its compliance filing, the Department directs the Company to apply the recalculated realization rate per the Department's directive regarding the C/I Retrofit Program in Section II.A., above, to the savings estimates for all applicable end uses that were installed through discontinued DSM programs in 1991. For all discontinued residential DSM programs, consistent with our finding that the savings estimates for ongoing residential DSM programs were sufficiently unbiased and precise, and because the savings estimates for the 1991 programs were based on these estimates, the Department finds the Company's

savings estimates for the 1991 residential DSM installations sufficiently unbiased and precise.

## III. LOST BASE REVENUE

### A. Methodology

#### 1. The Company's Proposal

The Company proposed in its original filing in the instant proceeding to alter the conservation charges to include the recovery of LBR associated with savings achieved in calendar year 1993 from DSM program installations during 1992 and 1993 (Exh. EE-2, at 7).[30] The Company sought to recover transmission and distribution ("T&D") system costs that previously were allowed in base rates but are no longer recovered due to the energy savings (i.e., lost KWH sales) from DSM program implementation (id. at 5-7). To determine LBR, the Company first calculated rate category-specific factors for all residential rate classes combined and for all C/I rate classes combined by dividing T&D revenue requirement for each category by energy sales during the test year for that category (id. at 6). The Company then multiplied those rate category-specific factors by category-specific energy savings achieved during 1993 (i.e., those savings produced by 1992 and 1993 DSM program installations) to determine total lost revenue for each category (id. at 5, 7). Finally, the Company divided the total lost revenue amount by forecasted energy sales in each rate category to determine the LBR factors that it proposes to add to the CCs for each rate category (id. at 5).

The various LBR factors were calculated for a thirteen-month period from

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[30] The Company used annualized savings estimates for both 1992 and 1993 when calculating 1993 LBR.

December 1, 1994 through December 31, 1995.[31] The Company calculated a LBR factor of $0.00031 per KWH for residential rate classes and $0.00023 per KWH for commercial and industrial rate classes. The Company estimated that the proposed LBR factors would result in bill impacts, as a percentage of current bills, ranging from 0.23 to 0.33 percent for residential rate classes and from 0.16 to 0.23 percent for commercial and industrial rate classes.

During the course of hearings, the Company modified its request to include revenue lost during 1993 from DSM implementation in 1991 (i.e., the Company's last test year), because not all of the energy savings associated with 1991 DSM installations were reflected in the test-year energy sales upon which base rates were set (DPU-RR-16). The Company proposed to use one half of the annualized savings achieved in 1991, or 5,616,772 KWH, as a proxy for energy savings that were not reflected in the test-year energy sales (id.).

On December 1, 1994, the Company submitted revised CC values to be implemented January 1, 1995 through December 31, 1995 (Exh. DPU-1, at 2). The revised CC values included proposed LBR due to energy savings during 1993 and 1994 (id. at 17). The 1993 LBR was based on one half of the annualized savings estimates from 1991 and 1993, and the annualized savings estimates from 1992 (id.).[32] The 1994 LBR calculation excluded any

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[31] At the procedural conference in this docket held on August 16, 1994, Eastern agreed to extend the effective date of the proposed CCs an additional month to January 1, 1995.

[32] To approximate the energy savings obtained from six months of program installations for 1991 and the energy savings obtained from program installations made throughout the year in 1993, the Company used one half of the annualized or total energy savings from those program installations when calculating LBR recovery for 1993 (Exh.

savings estimates from installations made in 1991 and included annualized savings from 1992 and 1993 (id.). The revised CC values included an LBR factor of $0.0005 for both the residential and C/I rate categories (Exh. DPU-1, Supp. at 4).

2. Analysis and Findings

The Department has indicated in previous Orders that in quantifying LBR for recovery from ratepayers it is necessary to determine a reasonable estimate of actual energy savings that result from a company's DSM programs. See, Western Massachusetts Electric Company, D.P.U. 89-260, at 107 (1990) ("D.P.U. 89-260"). In the instant proceeding, the Company originally calculated LBR for 1993, in part, from annualized energy savings due to 1993 DSM implementation. The Department notes that, because installation of ECMs occurs throughout the year of implementation, energy savings from DSM installations in a given year would not achieve their cumulative energy and demand savings potential until the following year -- in this instance, 1994. The Department notes that the revised LBR calculations, filed on December 1, 1994, included one half of the annualized savings from 1993 to approximate the energy savings that resulted in lost revenues in 1993. The Department finds that although the Company's revised LBR calculation does not reflect an estimate of energy savings based on actual ECM installations over the course of the year, it provides a reasonable approximation of the energy savings associated with 1993 installations eligible for LBR recovery for purposes of the instant proceeding. Therefore, the Department accepts the revised calculation of 1993 LBR from 1993 installations, as filed on December 1,

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DPU-1).

1994, subject to the modification ordered in Section II.A.3, above, regarding the C/I Retrofit Program, for purposes of calculating LBR. However, in future DSM proceedings, the Department directs the Company to calculate LBR to be recovered by estimating the quantity of energy savings associated with the timing and size of the actual ECM installations over the course of the year for each year of DSM implementation where annualized savings estimates do not reflect actual savings achieved.

Regarding the Company's modified proposal to include savings from 1991 DSM implementation, the Department has stated that it is appropriate to allow recovery of LBR due to savings that were not reflected in the test year sales upon which base rates were determined. See Boston Edison Company, D.P.U. 91-233-A at 14-15 (1994). However, the Department notes that because several of the discontinued programs for which the Company seeks LBR were not implemented throughout the entire test year, more than half of the annualized savings were included in the calculation of test year sales. Therefore, the Department will not allow the Company to recover LBR based on 50 percent of the annualized savings associated with these installations as proposed (Exh. EE-1, Supp. at 4-5). The Department finds that the recovery of LBR should reflect, as nearly as possible, the quantity of energy savings that were not included in the test year energy sales. Therefore, the Department will allow the Company to recover LBR associated with one half of the fraction of yearly installations that were made for each program in 1991. That is, if a program installed ECMs for three-fourths of the year, the Department will allow the Company to recover LBR based on three-eighths (i.e., one-half of three-fourths) of the annualized energy savings obtained by that program's installations in 1991. Accordingly, the

Department directs the Company to submit, as part of its compliance filing, revised savings estimates for discontinued DSM programs based on one-half of the fraction of the year in which ECMs were installed.

Regarding the Company's modified proposal to recover LBR for energy savings during 1994, the Department notes that, as with recovery of 1993 LBR, recovery of 1994 LBR based on savings estimates derived from tracking estimates and/or process evaluations will be reconciled based on more precise impact evaluations. Therefore, the Department approves the recovery of 1994 LBR in the 1995 CCs. The Department notes that the Company, in its proposal to recover 1994 LBR, removed from the calculation 1991 savings estimates. The Department notes that, consistent with our decision in Section III.C, below, the Company is entitled to recover LBR associated with savings due to implementation in 1991 in 1994. Therefore, as part of its compliance filing to this Order, the Department will allow the Company to modify its request to recover LBR for 1994 from savings obtained through 1991 installations.

B. Alternative Methodologies

1. Introduction

During hearings, three alternative methodologies by which LBR recovery could be calculated were discussed. The first alternative methodology was to calculate LBR by determining a gross LBR amount (i.e., similar to that provided by the Company in their proposal) and subtracting the costs that have been avoided as a result of the implementation of DSM ("Avoided Cost Methodology"). The Company provided information indicating that approximately 50 percent of its historic transmission system investments were load-growth-

related and therefore potentially avoidable due to DSM implementation (Exh. DPU-2-8). However, the Company indicated that a similar analysis could not be performed in a reasonable timeframe for the Company's distribution system, the costs of which represent the major portion of the Company's LBR (id.; Exh. EE-2, Sch. 1, at 2).

The second alternative methodology was for the Company to recover Department-approved LBR associated with a specific year of DSM implementation for a set number of years equal to the average length of time between each of the Company's last four rate cases, or until new rates take effect subsequent to a new base rate proceeding, whichever comes first ("Rolling Period Methodology"). The Company calculated that the average length of time between each of its last four base rate cases was three years (Exh. DPU-3-24).

The third alternative methodology was to allow the recovery of LBR based on whether the Company earned its allowed return on equity ("ROE"), as specified in its last base rate case proceeding, during the year that the revenue was lost ("ROE Cap Methodology"). Specifically, for any year where the Company earned its allowed ROE, the ROE Cap Methodology would not allow recovery of LBR that occurred during that year.

2. Positions of the Parties

a. Attorney General

The Attorney General argues that some modification to the existing methodology to calculate LBR "is necessary to reconstitute LBRs as a short term, revenue neutral remedy" (Attorney General Brief at 6, citing Western Massachusetts Electric Company, D.P.U. 94-8A-CC at 6 (1994). The Attorney General contends that LBR recovery was not intended to increase the profits of electric companies, but was intended to address the

concern that implementing DSM would unfairly penalize companies by pushing their rates of return below allowed rates (id., citing D.P.U. 86-36-F at 35). The Attorney General asserts that a threshold requiring that a company earn less than an allowed ROE before recovering any LBR "is not in any sense unfair unless one incorrectly assumes companies have a right to excess earnings" (id.).

The Attorney General proposes that the Department adopt a method that combines the Rolling Period Methodology and the ROE Cap Methodology ("Combined Methodology") (id.). Specifically, the Attorney General argues that the Department should limit recovery of LBR to companies failing to earn their allowed ROE, capping the amount of LBR at a level no greater than that necessary to eliminate any earnings shortfall, and then limit the recovery period to a span that represents the company's historical period between base rate filings (id. at 6-7). The Attorney General contends that the Combined Methodology would "recognize the two primary aims of the Department" in allowing LBR recovery: revenue neutrality and the short-term nature of the intended remedy (id. at 7). The Attorney General states that, according to the proposed Combined Methodology, only after the Company had demonstrated that it had not earned its allowed ROE in any year would the Department review impact evaluations to determine lost revenue and to establish an appropriate time-span for recovery of LBR based on the Company's actual, average period between base rate proceedings (id.).

b. The Company

The Company opposes the Attorney General's proposal to link recovery of LBR to the Company's actual return on equity (Company Brief at 3). The Company argues that, contrary to the Attorney General's statement, the Department's policy states that LBR

recovery was intended to "compensate for any significant sales erosion and resultant revenue loss caused by successful [DSM] programs" (id., citing D.P.U. 86-36-F at 35 (1988)). The Company contends that the Attorney General improperly substituted the term "earnings erosion" in place of "revenue erosion" in interpreting the Department's Order in D.P.U. 86-36-F and the regulations codified at 220 C.M.R. § 10.02 (id. at 4).[33] The Company contends that the Department never intended to use LBR recovery as a means to adjust a utility's net income, and that coupling recovery of LBR with earnings is inconsistent with regulatory law and policy and will cause a reduction in DSM activities in the Commonwealth (id.). The Company further stated that recovery of LBR "should not be used to offset efficient company actions (cost cutting, load shaping, etc.) necessary to earn at or above the allowed return. In today's competitive environment for both customers and capital, the incentive for implementing DSM programs ought to stand on its own, and should not undermine management's effort to increase earnings" (Exh. DPU-RR-9).

The Company further contends that the Attorney General incorrectly asserted that "a company earning above its allowed return has no right to 'excess earnings'" (Company Brief at 5). The Company argues that, under Massachusetts law, rates are presumed to be just and reasonable until the Department, after concluding an investigation, finds otherwise (id., citing

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[33] The Company notes that the Department's integrated resource management regulations define revenue erosion from DSM as "a situation in which [DSM] measures or programs result in lower energy use than occurred in the test year of an electric company's most recent rate case, causing the electric company to sell less electricity than was assumed in the most recent case in establishing rates to produce the company's allowed revenue requirement" (Company Brief at 4, citing 220 C.M.R. § 10.02).

G.L. c. 164, § 94). The Company asserts that any so-called "excess earnings" should not be returned to customers any more than past earnings deficiencies should be recovered from customers (id.). The Company argues that the Attorney General's proposed Combined Methodology will provide the Company's management with inappropriate signals in that "whatever gains management has achieved between rate cases through the improvement of load factor and the reduction of operating and maintenance expenses to advance the utility's competitive position will be erased annually" (id. at 6).

The Company also contends that the Attorney General's proposal cannot be administered fairly because many companies have settled the revenue requirements portion of their recent base rate proceedings without specific findings by the Department regarding allowed rates-of-return (id.). The Company asserts that, for these companies, the Attorney General's proposal would introduce a new term into established settlement agreements that would undermine those agreements (id.).

The Company stated that the Avoided Cost Methodology is conceptually problematic because "it mixes embedded (actual) costs and avoided (projected) costs, and is not reflective of the Company's base revenue lost due to the successful implementation of conservation" (Exh. DPU-2-21).

On the record, the Company stated that it saw no advantages to the Rolling Period Methodology, which "may make a company file for general rate relief sooner than it would otherwise," over the Company's proposed LBR methodology (Exh. DPU-2-20). On brief, the Company states that of the three methodologies for the recovery of LBR proposed by the Department, it endorses only the Rolling Period Methodology (Company Brief at 6). The

Company now contends that the Rolling Period Methodology "is consistent with regulatory policy and can be implemented by all utilities without significantly altering regulatory policy" (id.).

3. Analysis and Findings

In D.P.U. 86-36-F at 35-36, the Department stated that it would entertain proposals for lost revenue adjustments if a company could demonstrate that "the successful performance of its [DSM] programs will result in sales erosion that adversely affects revenue in a significant, quantifiable way." The Department later indicated that the recovery of LBR might only be necessary for the "short term" because, in the long term, companies would be able to adjust their operating costs to reflect any reduction in sales. D.P.U. 89-260, at 106. In D.P.U. 89-260, the Department defined the short term as "less than one year." Id.

In Commonwealth Electric Company/Cambridge Electric Light Company, D.P.U. 93-15/16, at 9 (1993), the Department reaffirmed the D.P.U. 89-260 decision and directed the companies to provide an analysis of the fixed costs not recovered because of DSM implementation. The Department required a similar analysis of Boston Edison Company in its order on that Company's 1994 conservation charge. D.P.U. 91-233-A at 17.

In the instant proceeding, the Department investigated various LBR recovery methodologies to determine the extent to which they reflect the fact that the Company's implementation of DSM programs will, over time, permit a reduction in the cost of providing electric service to ratepayers. In doing so, the Department investigated the extent to which the proposed methodologies would allow for the determination of net revenue lost due to DSM implementation; i.e., the Company's base revenue that is truly lost after taking into

account the opportunities to reduce the cost of electric service. Through this investigation, the Department sought an LBR recovery methodology that would provide sufficient incentive to the Company's management to reduce costs and to operate the Company's resources as efficiently as possible. Finally, the Department sought an LBR recovery methodology in this proceeding that was consistent with Department precedent, potentially applicable to all electric companies, and relatively simple to administer.

In evaluating the Avoided Cost Methodology, Eastern submitted an analysis indicating that there is a significant relationship between load growth and transmission investment. The Company, however, was unable to provide a similar analysis relating to distribution investment, which constitutes a major portion of the Company's lost T&D revenue that might be recovered through a LBR mechanism. The Department finds that with good information, the Avoided Cost Methodology could provide an accurate determination of the effect of DSM energy and capacity savings on the Company's bottom line (i.e., the reduction in revenue minus the reduction in costs). However, because of the administrative burden this methodology would impose upon the Company, as well as the lack of good data, the Department finds that the Company could not apply the Avoided Cost Methodology with a reasonable level of statistical confidence. Therefore, the Department finds that the Avoided Cost Methodology is not appropriate to apply in this proceeding.

In evaluating the ROE Cap Methodology, and the Combined Methodology as proposed by the Attorney General, the Department finds the Company's argument persuasive. The Department has in its earlier decisions stated that recovery of LBR should account for lost revenues, not lost earnings. D.P.U. 86-36-F, at 35-36; D.P.U. 89-260,

at 104, 105. Although the Company did not present evidence to support its contention, the Department would agree that the ROE Cap Methodology and the Combined Methodology may create a disincentive for the Company to advance its competitive position through cost reductions and implementation of other operational efficiencies. In addition, the Department finds it inappropriate to assume, for the instant proceeding, that an increase in earnings caused by a potentially broad range of factors (e.g., a lower cost health care plan) is associated in any way with the reduction in costs due to DSM implementation. Furthermore, the Department agrees with the Company that, because the Company's most recent base rate case was settled and a rate-of-return value was not specified by that settlement, any effort to determine an appropriate ROE would be administratively burdensome (if not impossible) and could undermine that negotiated agreement. Therefore, the Department finds that neither the ROE Cap Methodology nor the Combined Methodology is appropriate to apply in this proceeding.

In evaluating the Rolling Period Methodology, the Department finds that this methodology best meets the Department's current objectives. First, because the Rolling Period Methodology allows for the recovery of lost base revenue for a period equal to the average, historic time span between rate cases, it provides a reasonable approximation of the distinction between the Company's short-term and long-term costs and thus, a reasonable approximation of the extent to which the Company's implementation of DSM programs will, over time, reduce the costs of providing electric service to its ratepayers. That is, when proposing a modification to its base rates, the Company would effectively indicate that the test year is evident of a change in its long-term (i.e., recurring, periodically recurring or

extraordinary[34]) costs to provide electric service. See Fitchburg Gas and Electric Light Company, D.P.U. 1270/1414, at 33 (1983). In addition, the reduction in load growth associated with DSM should allow the Company to alter (i.e., defer, reduce or terminate) its long-term T&D investments. Further, the impending restructuring of the electric utility industry has provided a profound incentive to electric utilities to maintain stable rates and reduce the frequency of rate case filings. To the extent that the Company does not file a base rate case for a period longer than the average, historic time span between rate cases, the Department observes that certain cost reductions made possible by DSM can help maintain a company's profitability.

Second, the Department finds that, unlike the Avoided Cost Methodology and the ROE Cap Methodology, the Rolling Period Methodology will provide the Company with a direct and consistent incentive to reduce costs and to improve the efficiency of operations wherever and whenever possible.

Third, the Department finds that the Rolling Period Methodology is consistent with precedent because cost recovery for several components of a company's cost of service (e.g., rate case expense) is treated in a similar manner; it could be applied to all electric companies; and it would be relatively simple to administer. Accordingly, the Department will allow the Company to recover LBR associated with each DSM implementation year for a period equal to the average timespan between each of its last four rate cases: three years.

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[34] Although extraordinary costs cannot be anticipated and, therefore, are not recurring or long-term in nature, they must be amortized over an extended period of time to allow for consistency in rate design. Fitchburg Gas and Electric Light Company, D.P.U. 1270/1414, at 33 (1983).

The Department notes that the Rolling Period Methodology will not affect the Company's recovery of LBR in 1995, but will remove from the Company's LBR calculation, for 1996, LBR recovery associated with energy savings from DSM program implementation in 1991 and will include LBR recovery for energy savings associated with implementation in 1994.

C. Recovery of LBR Based on Engineering Estimates

1. Introduction

Of the seven DSM programs (five residential and two C/I) implemented by the Company during 1991, 1992, and 1993, savings estimates for only the two C/I programs and the Multifamily program were based on impact evaluations prepared by third-party consultants (Exh. EE-1, Sch. CSW-7). The Company proposed to offer as a late-filed exhibit an impact analysis of its single family retrofit program, as support for LBR recovery for savings from this program (Tr. 3, at 15).

The Company's other residential programs' savings estimates were based on engineering estimates, tracking system data, and process evaluations. Based on the Company's best estimates, the energy savings from the Company's residential programs represent 62 percent of the total energy savings in 1992 and 36 percent of the total energy savings in 1993 from all of the Company's DSM programs (Exh. EE-1, Sch. CSW-7).

2. Positions of the Parties

a. Attorney General

The Attorney General argues that the Department has consistently limited recovery of LBR and financial incentives to actual savings data or estimates founded upon such data (Attorney General Brief at 8, citing Boston Gas Company, D.P.U. 93-108, at 15-16, 19-22

(1994); Massachusetts Electric Company, D.P.U. 89-194/195, at 181 (1990)). The Attorney General also contends that unless there is an opportunity for discovery, hearings and briefing on any impact evaluations late-filed in this proceeding by the Company, the Department should reject the offering as untimely (id., citing Boston Gas Company, D.P.U. 93-60, Order on Appeal of Hearing Officer Ruling, dated September 29, 1993). The Attorney General asserts that the Department should deny recovery of LBR based on savings estimates associated with any of Eastern's DSM programs that lack timely filed impact analyses (id.).

b. The Company

The Company argues that the acceptance of savings estimates based on engineering estimates is consistent with Department precedent established in the orders cited by the Attorney General in his brief (Company Brief at 7, citing Attorney General Brief at 8). The Company contends that the Attorney General provides no reason to use a different standard for Eastern (id.). The Company also argues that any modifications to the LBR recovered due to revised savings estimates based on impact evaluations can be incorporated in the Company's next CC filing (id.).

3. Analysis and Findings

In the past, the Department has allowed companies implementing DSM to recover LBR based on engineering estimates, so long as such LBR is reconcilable based on measured savings. See Western Massachusetts Electric Company, D.P.U. 91-44, at 108-109 (1991). Specifically, the Department has allowed recovery of LBR based on a two-step process: a "first look" whereby savings estimates are based on tracking data (i.e., actual participation

and number of measure installations);[35] and a "second look" whereby savings estimates are based on impact evaluations. Id. at 108-109. The Department has labeled this process a "double reconciliation methodology" and found it appropriate for all electric companies seeking recovery of LBR. See Fitchburg Gas and Electric Company, D.P.U. 94-5B-CC at 18 (1994); D.P.U. 91-233-A at 12, 13. Therefore, the Department finds the Company's proposal to recover LBR associated with savings estimates developed through tracking estimates and adjusted by data gathered in process evaluations (i.e., savings unsupported by an impact evaluation) to be reasonable and consistent with Department precedent. Accordingly, the Department approves the Company's residential program savings estimates consistent with any modifications specified in Sections II.C. through II.F., above. The Department notes that all LBR recovered based on these savings estimates will be fully reconcilable based on the Department's future reviews of net savings estimates and supporting impact evaluations.

D. Allocation of LBR

1. Company Proposal

The Company proposed to allocate the 1993 LBR recovery to residential and C/I customers, respectively, based on the total savings achieved by its residential and C/I programs (Exh. EE-2, at 3). The Company determined LBR factors based on the aggregated lost revenue for each rate category (i.e., residential and C/I) (id. at 5, 7). The Company

[35] Often referred to as gross savings estimates, first look savings estimates may include some adjustments based on process evaluations, past years' impact evaluations or other adjustments.

proposed an LBR factor of $0.0005 for its residential customers and a factor of $0.0005 for its C/I customers (Exh. DPU-1, at 4).

The Company indicated that it does not track energy savings by rate class (e.g., residential rate R-1 versus R-2), and that energy savings information is maintained only on a program-specific basis (Exh. DPU-3-21). The Company, however, does track DSM-related expenditures on a rate class basis (id.). The Company also indicated that because LBR recovery is a component of the CC factor under the Company's conservation charge tariff, LBR factors were calculated in the same manner as the CC factor for this filing (Exh. DPU-3-22).

2. Analysis and Findings

The Department has stated that DSM program costs should be allocated to the rate classes that receive the benefit of those expenditures. Commonwealth Electric Company/Cambridge Electric Light Company, D.P.U. 91-80, Phase Two-A at 138 (1992). The Department also determined that recovery of LBR should be based on the savings achieved by each rate class and should be reconciled based on measured savings. Boston Edison Company, D.P.U. 91-233-A at 8 (1994). However, because the information is not available in this proceeding, and given the fact that the proposed LBR factors are based on T&D only and result in relatively small bill impacts, the Department will allow the Company to allocate LBR on a category-specific basis, as proposed. In future CC proceeding filings, the Department directs the Company to take all reasonable steps to calculate energy savings, and thus LBR, on a class-specific basis. Further, the Department directs the Company to revise its conservation charge tariff to reflect allocation of LBR on this basis and to reflect

the double reconciliation of LBR, and to submit the revised tariff as part of its compliance filing to this Order.

## IV. CONSERVATION CHARGES

### A. Company Proposal

The Company proposed to recover 1995 DSM program expenditures and 1993 LBR and to reconcile program expenditures from 1994 through new CCs beginning January 1, 1995 (Exh. EE-2, Sch. 3). Based on an updated filing, the Company proposed new CCs for residential rate classes ranging from 0.16 cents per KWH (for the R-4 rate class) to 0.56 cents per KWH (for the R-3 rate class), and for C/I rate classes from 0.21 cents per KWH (for the G-6 rate class) to 0.67 cents per KWH (for the G-5 rate class) (Exh. DPU-1, at 7).

The Company calculated the proposed CCs by first adding projected 1995 DSM expenditures for each rate category (i.e., all residential rate classes combined and all C/I rate classes combined),[36] indirect expenses for each rate category, overrecovery from 1994 for each rate category, and LBR from 1993 and 1994 for each rate category, and dividing the sum by forecasted 1995 KWH sales for each rate category (id. at 3, Sch. 2). Based on that analysis, the Company calculated CCs of 0.26 cents per KWH for the residential rate category and 0.44 cents for the C/I rate category (id. at Sch. 2, at 1).

The initial CCs were adjusted by what the Company refers to as a "true-up charge

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[36] The proposed program expenditures in the Company's December 1, 1994 filing for 1995 DSM program implementation are consistent with those filed with the FERC on November 1, 1994 (Exh. DPU-4).

factor" ("TC Factor") (id. at Sch. 3). The TC Factor reconciles, for each rate class, actual DSM expenditures with revenue recovered during the period October 1, 1993 through September 30, 1994 (id.). The Company combines the initial CCs with the rate class-specific TC Factors to determine final rate class-specific CCs (id., at Sch. 1). The Company revised the proposed CC based on updated savings estimates and budget projections (Exh. DPU-1, at 11, 17). The revised CCs range from 0.16 cents per KWH to 0.56 cents per KWH for residential rate classes, and from 0.39 cents per KWH to 0.68 cents per KWH for C/I rate classes.

B. Analysis and Findings

The Department has determined that cost allocation of DSM program expenditures should be designed to reflect a company's cost to serve each rate class, directly assigning those costs attributable to providing services to a given class and fairly apportioning common costs when direct assignment is impossible. Massachusetts Electric Company, D.P.U. 89-194/195, at 211 (1990). The Department notes that the Company's proposal, over time, directly assigns costs to those rate classes participating in the Company's programs by reconciling any costs with revenue collected from each class through the TC Factor mechanism. The Department finds that the Company's proposal regarding allocation of DSM program expenses is consistent with Department policy, and therefore, approves the proposed allocation methodology.

The Department also notes that the Company's 1996 DSM program designs and budgets are subject to Department approval. The Department directs the Company to submit proposed 1996 CCs at the time the program designs and budgets are filed for Department

approval in September 1995.

V. ORDER

Accordingly, after due notice, and consideration, it is

ORDERED: That Eastern Edison Company's request for approval of the proposed conservation charges as filed with the Department of Public Utilities on June 29, 1994, for the period September 1, 1994 through December 31, 1995, and as subsequently amended by the Company on December 1, 1994, for the period January 1, 1995 through December 31, 1995, be and hereby is DENIED; and it is

FURTHER ORDERED: That Eastern Edison Company modify the Commercial and Industrial Retrofit Program savings estimates consistent with the directives specified in Section II.A, above; and it is

FURTHER ORDERED: That Eastern Edison Company implement its plans to refine persistence figures for the Commercial and Industrial Retrofit Program in future years; and it is

FURTHER ORDERED: That Eastern Edison Company shall, as part of its compliance filing, apply the recalculated realization rate per the Department's directive regarding the C/I Retrofit Program in Section II.A., above, to the savings estimates for all applicable end uses that were installed through discontinued DSM programs in 1991; and it is

FURTHER ORDERED: That Eastern Edison Company shall submit, as part of its compliance filing, revised savings estimates for discontinued DSM programs based on one-half of the fraction of the year in which ECMs were installed; and it is

FURTHER ORDERED: That Eastern Edison Company implement the Department's

Rolling Period Methodology, as discussed in Section III.B., above, for the recovery of lost base revenue in 1996, and it is

FURTHER ORDERED: That Eastern Edison Company's proposal to allocate lost base revenue on a rate category-specific basis, be and hereby is, APPROVED; and it is

FURTHER ORDERED: That Eastern Edison Company, in future conservation charge filings, shall take all reasonable steps necessary to calculate energy savings, and thus lost base revenue, on a rate class-specific basis, and it is

FURTHER ORDERED: That Eastern Edison Company submit its compliance filing to the Department within five business days of the issuance of this Order; and it is

FURTHER ORDERED: That Eastern Edison Company comply with all directives of this Order.

By Order of the Department,

_____
Kenneth Gordon, Chairman

_____
Mary Clark Webster, Commissioner

Appeal as to matters of law from any final decision, order or ruling of the Commission may be taken to the Supreme Judicial Court by an aggrieved party in interest by the filing of a written petition praying that the Order of the Commission be modified or set aside in whole or in part.

Such petition for appeal shall be filed with the Secretary of the Commission within twenty days after the date of service of the decision, order or ruling of the Commission, or within such further time as the Commission may allow upon request filed prior to the expiration of twenty days after the date of service of said decision, order or ruling. Within ten days after such petition has been filed, the appealing party shall enter the appeal in the Supreme Judicial Court sitting in Suffolk County by filing a copy thereof with the Clerk of said Court. (Sec. 5, Chapter 25, G.L. Ter. Ed., as most recently amended by Chapter 485 of the Acts of 1971).